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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,874	12/14/2005	Patrick Ferguson	K5P909US1	3700

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ART UNIT	**PAPER NUMBER**
1734	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,874	FERGUSON ET AL.	
	Examiner	Art Unit	
	Sonya Mazumdar	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2005 and 19 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11,12 and 14-16* is/are rejected.

7)☒ Claim(s) *10 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/19/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1 through 7 and 9 are rejected under 35 U.S.C. 103(a) as being obvious over Neri et al. (US 2002/0131062) in view of the admitted prior art and Gardner (US 6,483,087).

With respect to claims 1 and 2, Neri et al. teach a method of printing an image onto a plastic three-dimensional surface with non-planar surfaces by an dye-bearing, imaged carrier sheet. A flexible membrane is lowered over the three-dimensional object with the image carrier sheet thereon. A vacuum is established and the membrane, image carrier sheet, and object are heated by radiant heating elements to cause the image from the carrier sheet to transfer into the surface the carrier sheet is on (abstract; paragraphs 0006-0007; Figure 6).

Neri et al. do not teach placing an image carrier sheet with a flexible heating element. However, it would have been obvious to provide flexible heating elements in a carrier sheet, as taught in the Applicant's specification (page 12, line 24 – page 13, line 6 and page 13, lines 12-14), and would have been motivated to do so since providing heating elements in a sheet is an advantage taught by Gardner, which would provide flexibility and even heat distribution (Gardner - column 3, lines 4-7).

With respect to claims 3 and 5, Neri et al. teach an image carrier sheet comprising of a film or fabric (paragraph 0033).

With respect to claim 4, Neri et al. in view of the admitted prior art and Gardner et al. teach providing a metal foil with flexible heating elements in a metal foil bonded to a carrier film, as it is conventional for use in the aerospace industry (Gardner: column 1, lines 22-30).

With respect to claims 6 and 7, Neri et al. in view of the admitted prior art and Gardner et al. teach it is known to use an image carrier sheet comprising a metallized fabric substrate with a photochemically-etched electrical circuit therein (Applicant's specification: page 12, line 24 – page 13, line 6 and page 13, lines 12-14).

With respect to claim 9, Neri et al. teaches that an image carrier sheet is heated to make it more flexible after a flexible membrane is lowered over the carrier sheet and prior to establishing a vacuum (abstract).

3. Claims 1 through 7 and 9 are rejected under 35 U.S.C. 103(a) as being obvious over Neri et al. (US 7,267,737) in view of the admitted prior art and Gardner et al.

With respect to claims 1 and 2, Neri et al. teach a method of printing an image onto a plastic three-dimensional surface with non-planar surfaces by an dye-bearing,

imaged carrier sheet. A flexible membrane is lowered over the three-dimensional object with the image carrier sheet thereon. A vacuum is established and the membrane, image carrier sheet, and object are heated by radiant heating elements to cause the image from the carrier sheet to transfer into the surface the carrier sheet is on (abstract; column 3, lines 61-65; Figure 6).

Neri et al. do not teach placing an image carrier sheet with a flexible heating element. However, it would have been obvious to provide flexible heating elements in a carrier sheet, as taught in the Applicant's specification (page 12, line 24 – page 13, line 6 and page 13, lines 12-14), and would have been motivated to do so since providing heating elements in a sheet is an advantage taught by Gardner, which would provide flexibility and even heat distribution (Gardner - column 3, lines 4-7).

With respect to claims 3 and 5, Neri et al. teach an image carrier sheet comprising of a film or fabric (column 7, line 64 – column 8, line 2).

With respect to claim 4, Neri et al. in view of the admitted prior art and Gardner et al. teach providing a metal foil with flexible heating elements in a metal foil bonded to a carrier film, as it is conventional for use in the aerospace industry (Gardner: column 1, lines 22-30).

With respect to claims 6 and 7, Neri et al. in view of the admitted prior art teach it is known to use an image carrier sheet comprising a metallized fabric substrate with a photochemically-etched electrical circuit therein (Applicant's specification: page 12, line 24 – page 13, line 6 and page 13, lines 12-14).

With respect to claim 9, Neri et al. teaches that an image carrier sheet is heated to make it more flexible after a flexible membrane is lowered over the carrier sheet and prior to establishing a vacuum (abstract).

4. Claims 1 through 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastie et al. (WO 01/96123) in view of Neri et al. (US '062) and the admitted prior art and Gardner et al.

With respect to claims 1, 2 and 9, Hastie et al. teach a method of printing an image onto a plastic three-dimensional surface with non-planar surfaces by a printed transfer element (abstract; page 1, paragraph 1). The printed transfer element is placed over the object, which has a receptor coating, and is heated to make it more flexible. The transfer element is vacuum formed onto the surface and heated to at least partially transfer the image from the transfer element to the object (abstract; page 2, paragraph 5 – page 3, paragraph 2; page 4, paragraph 1).

Hastie et al. do not specifically teach using a flexible membrane over a printed transfer layer atop a three-dimensional surface. Neri et al. teach a method of printing an image onto a plastic three-dimensional surface with non-planar surfaces by an dye-bearing, imaged carrier sheet. A flexible membrane is lowered over the three-dimensional object with the image carrier sheet thereon. A vacuum is established and the membrane, image carrier sheet, and object are heated by radiant heating elements to cause the image from the carrier sheet to transfer into the surface the carrier sheet is on (abstract; paragraphs 0006-0007; Figure 6).

It would have been obvious for Hastie et al. to teach using a flexible membrane used in the vacuum forming step in transfer printing as Neri et al. taught and would

have been motivated to do so to vacuum form surfaces of different shapes and sizes, and furthermore, the flexible membrane is matched with the heating elements so that it is specifically absorptive to radiation within the wavelength range emitted therefrom to achieve optimum heating efficiency (Neri: paragraph 0006).

Neri et al. do not teach placing an image carrier sheet with a flexible heating element. However, it would have been obvious to provide flexible heating elements in a carrier sheet, as taught in the Applicant's specification (page 12, line 24 – page 13, line 6 and page 13, lines 12-14), and would have been motivated to do so since providing heating elements in a sheet is an advantage taught by Gardner, which would provide flexibility and even heat distribution (Gardner - column 3, lines 4-7).

With respect to claims 3 and 5, Hastie et al. in view of Neri et al., the admitted prior art, and Gardner et al. teach an image carrier sheet comprising of a film or fabric (Neri: paragraph 0033).

With respect to claim 4, Neri et al. in view of the admitted prior art and Gardner et al. teach providing a metal foil with flexible heating elements in a metal foil bonded to a carrier film, as it is conventional for use in the aerospace industry (Gardner: column 1, lines 22-30).

With respect to claims 6 and 7, Hastie et al. in view of Neri et al., the admitted prior art, and Gardner et al. teach it is known to use an image carrier sheet comprising a metallized fabric substrate with a photochemically-etched electrical circuit therein (Applicant's specification: page 12, line 24 – page 13, line 6 and page 13, lines 12-14).

With respect to claim 9, Hastie et al. in view of Neri et al., the admitted prior art, and Gardner et al. teach that an image carrier sheet is heated to make it more flexible

after a flexible membrane is lowered over the carrier sheet and prior to establishing a vacuum (Neri: abstract).

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neri et al. (US '062) in view of the admitted prior art, and Gardner et al. as applied to claim 7 above, and further in view of Kitagawa (US 5,090,122)

The teachings of claim 3 are as described above.

Neri et al. in view of the admitted prior art do not specifically teach coating an etched metallized fabric with a heat-resistant, electrically-insulating lacquer. However, it would have been obvious to do so, as taught by Kitagawa, and would have been motivated to do so as an improved alternative to electroless plating (Kitagawa: column 1, lines 8-35; column 2, line 56).

6. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being obvious over Neri et al. in view of Geary (US 3,956,552) and the admitted prior art.

With respect to claims 1 and 2, Neri et al. teach a method of printing an image onto a plastic three-dimensional surface with non-planar surfaces by an dye-bearing, imaged carrier sheet. A flexible membrane is lowered over the three-dimensional object with the image carrier sheet thereon. A vacuum is established and the membrane, image carrier sheet, and object are heated by radiant heating elements to cause the image from the carrier sheet to transfer into the surface the carrier sheet is on (abstract; paragraphs 0006-0007; Figure 6).

Neri et al. do not teach placing a membrane with a flexible heating element. However, it would have been obvious to provide flexible heating elements with a membrane, as Geary teaches using heating and vacuum pressurizing via an open mesh

carrier cloth (membrane) to transfer a pattern to a garment (G), and would have been motivated to do so since providing heating elements in a sheet would provide flexibility and even heat distribution (Geary: abstract; column 4, lines 62-65; Figures 4 and 6). The admitted prior art teaches that it is known to use a metallized fabric mesh sheet with a photochemically-etched electrical circuit therein as a heating element (Applicant's specification: page 12, line 24 – page 13, line 6). One would have been motivated to use the teachings of Geary and the admitted prior art to avoid any residue on background areas of a surface after transfer and also ensure the transfer is less sensitive to temperature of the heat source, the pressure applied, and the dwell time (Geary: column 2, lines 35-38 and lines 42-45).

With respect to claim 12, Neri et al. teaches that an image carrier sheet is heated to make it more flexible after a flexible membrane is lowered over the carrier sheet and prior to establishing a vacuum (abstract).

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neri et al. in view of Geary and the admitted prior art, as applied to claim 11 above, and further in view of Gibbs et al. (US 3,888,719)

The teachings of claim 11 are as described above.

The combined teachings of Neri et al., Geary, and the admitted prior art do not specifically teach using a flexible membrane made of silicon rubber. Gibbs et al. teach using a vacuum press where one surface is flexible and made of silicon rubber (column 3, lines 56-60).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a flexible membrane made of silicon rubber and would have

been motivated to do so to have a wall that is flexible and air-permeable to conform to any three-dimensional object of any shape or size.

8. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being obvious over Neri et al. (US '062) in view of the admitted prior art and Gardner et al.

With respect to claim 15, Neri et al. teach a method of printing an image onto a plastic three-dimensional surface with non-planar surfaces by a dye-bearing, imaged carrier sheet. A flexible membrane is lowered over the three-dimensional object with the image carrier sheet thereon. A vacuum is established and the membrane, image carrier sheet, and object are heated by radiant heating elements to cause the image from the carrier sheet to transfer into the surface the carrier sheet is on (abstract; paragraphs 0006-0007; Figure 6).

Neri et al. do not teach placing an image carrier sheet with a flexible heating element. However, it would have been obvious to provide flexible heating elements in a carrier sheet, as taught in the Applicant's specification (page 12, line 24 – page 13, line 6 and page 13, lines 12-14), and would have been motivated to do so since providing heating elements in a sheet is an advantage taught by Gardner, which would provide flexibility and even heat distribution (Gardner - column 3, lines 4-7).

With respect to claim 16, Neri et al. teach that an image carrier sheet is heated to make it more flexible after a flexible membrane is lowered over the carrier sheet and prior to establishing a vacuum (abstract).

9. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being obvious over Neri et al. (US '737) in view of the admitted prior art and Gardner et al.

With respect to claim 15, Neri et al. teach a method of printing an image onto a plastic three-dimensional surface with non-planar surfaces by an dye-bearing, imaged carrier sheet. A flexible membrane is lowered over the three-dimensional object with the image carrier sheet thereon. A vacuum is established and the membrane, image carrier sheet, and object are heated by radiant heating elements to cause the image from the carrier sheet to transfer into the surface the carrier sheet is on (abstract; column 3, lines 61-65; Figure 6).

Neri et al. do not teach placing an image carrier sheet with a flexible heating element. However, it would have been obvious to provide flexible heating elements in a carrier sheet, as taught in the Applicant's specification (page 12, line 24 – page 13, line 6 and page 13, lines 12-14), and would have been motivated to do so since providing heating elements in a sheet is an advantage taught by Gardner, which would provide flexibility and even heat distribution (Gardner - column 3, lines 4-7).

With respect to claim 16, Neri et al. teach that an image carrier sheet is heated to make it more flexible after a flexible membrane is lowered over the carrier sheet and prior to establishing a vacuum (abstract).

10. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastie et al. (WO 01/96123) in view of Neri et al. (US '062), the admitted prior art, and Gardner et al.

With respect to claim 15, Hastie et al. teach a method of printing an image onto a plastic three-dimensional surface with non-planar surfaces by a printed transfer element (abstract; page 1, paragraph 1). The printed transfer element is placed over the object, which has a receptor coating, and is heated to make it more flexible. The transfer

element is vacuum formed onto the surface and heated to at least partially transfer the image from the transfer element to the object (abstract; page 2, paragraph 5 – page 3, paragraph 2; page 4, paragraph 1).

Hastie et al. do not specifically teach using a flexible membrane over a printed transfer layer atop a three-dimensional surface. Neri et al. teach a method of printing an image onto a plastic three-dimensional surface with non-planar surfaces by an dye-bearing, imaged carrier sheet. A flexible membrane is lowered over the three-dimensional object with the image carrier sheet thereon. A vacuum is established and the membrane, image carrier sheet, and object are heated by radiant heating elements to cause the image from the carrier sheet to transfer into the surface the carrier sheet is on (abstract; paragraphs 0006-0007; Figure 6).

It would have been obvious for Hastie et al. to teach using a flexible membrane used in the vacuum forming step in transfer printing as Neri et al. taught and would have been motivated to do so to vacuum form surfaces of different shapes and sizes, and furthermore, the flexible membrane is matched with the heating elements so that it is specifically absorptive to radiation within the wavelength range emitted therefrom to achieve optimum heating efficiency (Neri: paragraph 0006).

Neri et al. do not teach placing an image carrier sheet with a flexible heating element. However, it would have been obvious to provide flexible heating elements in a carrier sheet, as taught in the Applicant's specification (page 12, line 24 – page 13, line 6 and page 13, lines 12-14), and would have been motivated to do so since providing heating elements in a sheet is an advantage taught by Gardner, which would provide flexibility and even heat distribution (Gardner - column 3, lines 4-7).

With respect to claim 16, Hastie et al. in view of Neri et al., the admitted prior art, and Gardner et al. teach that an image carrier sheet is heated to make it more flexible after a flexible membrane is lowered over the carrier sheet and prior to establishing a vacuum (Neri: abstract).

Allowable Subject Matter

11. Claims 10 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

There are no prior art teachings found where a membrane, with or without carrying flexible heating elements, is pre-heated prior to establishing a vacuum to transfer an image from a carrier sheet to an object.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sonya Mazumdar whose telephone number is (571) 272-6019. The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Tucker can be reached on (571) 272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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